

DESCRIPTION OF *HESPEROMYS TRUEI*, A NEW SPECIES BELONGING TO THE SUBFAMILY MURINÆ.By R. W. SHUFELDT, *U. S. Army.*

Fort Wingate is a military station about 3 miles off the railroad in northwestern New Mexico. The country about it is hilly, with broad and more or less level valleys dividing the broken ranges. These hills support a growth of low piñons and a species of scrub-oak, while in many places their sides are covered with irregular groups of loose boulders of sandstone rock.

The highest point is something between 7,000 and 8,000 feet above the datum plane. The midsummer days may be very warm, and the thermometer has been known to fall as low as 15° Fahr. below zero in the winter months.

Among the smaller mammals to be found in this locality, the southwestern form of *Neotoma floridana* is probably the most abundant.

This handsome little rat often constructs its nest beneath one of the uptilted boulders, or sometimes in a fissure between two of them, and structures of this kind are frequently to be noticed in such situations as we ramble over the hill-sides, where the smaller masses of rocks are to be found. Occasionally it chooses for its home the shelter afforded by the gnarled roots of a piñon, where the elements have forced them above ground, or, more rarely, the hollow trunk of one of these trees, should it occur in a favorable situation.

Until the 16th of March, 1885, during my collecting excursions about Fort Wingate, I never experienced any difficulty in capturing, whenever I chose, a few specimens of this rat. All one had to do was to simply tear open one of their nests and pounce on its inhabitant with gloved hands. After the date mentioned, however, they suddenly disappeared, and on that very day I opened *seven* of these nests, apparently all new ones, only to find in each instance the owner missing.

On my way home from this unsuccessful hunt my attention was attracted to the outer covering of another nest protruding from an opening in the dead and hollow trunk of a small piñon, at least 2 feet above the ground. This was an uncommon site for the nest of a *Neotoma*, and taken in connection with the absence of the usual pile of rubbish about the entrance, and the small size of the trunk chosen, my curiosity was sufficiently aroused to determine me to investigate the occupant's stronghold.

The nest, composed of the fine fibers of the inner bark of the piñon, was soon pulled out, and its owner dislodged and captured alive and unhurt. It proved to be a mouse about half the size of the average *Neotoma*, colored very much like one, but possessing a pair of ears that

immediately impressed me on account of their being so disproportionately large for an animal of its dimensions.

For two days I kept this engaging little creature alive in my study for the purpose of making a drawing of its head and studies of its behavior and attitudes. It was then killed, carefully measured, skinned, and skeletonized.

A glance at its skull was sufficient to remove from my mind the last of any doubt I may have entertained as to its being a half-grown wood-rat. Indeed, its extraordinary ears had already fairly satisfied me of this fact, as they were fully as large, or even larger, than the average size of those appendages in the *Neotoma*. Besides, it was the wrong time of the year to come across a young animal of that species, to say nothing of the general appearance of maturity it evidenced both externally and in its skeleton.

Concluding, then, that it was some variety of *Hesperomys*, I forwarded the skin to my friend Mr. F. W. True, curator of the department of mammals in the United States National Museum. In his courteous and prompt reply he gave me to understand that he believed it to be "a typical *H. leucopus*, except so far as its ears are concerned." The diagnosis of course could not be conclusive, as he had not seen the skull of my specimen, and even the ears had somewhat shrunken in the skin, as they are sure to do.

Here the matter rested until the 16th of May, just two months after the capture of the specimen in question. On this date I was engaged in hunting for insects, not a thousand yards from the tree on the hill-side where my first specimen of *Hesperomys* was taken, but this time out in the broad valley that stretches between the latter point and the opposite range of hills. In turning over a heavy plank I surprised a family of field mice, but encumbered as I was with my collecting case and gun, I succeeded in capturing only the male and three half-grown young; the female and four more of the young ones making good their escape. The young proved to be about half the size of their parents, and of a deep slate color, forming a striking contrast with the light dun color of the latter.

Naturally, the first thing I examined in my new captive were his ears; these I found to be of like proportions with the same parts, as I remembered them, in eastern forms of field mice. These four specimens were consigned to alcohol for future comparisons with such other material as might come to hand.

Being convinced now that my first capture was a new species, I forthwith communicated with Mr. True to ascertain what could be done in regard to exact identification and description, as I was desirous of having the proper material before me for comparison.

Through this gentleman's kindness I was delighted to have at my command at the end of the following fortnight the subjoined list of additional specimens to compare with those already in my possession:

Specimens.	Locality.	Donor.	Catalogue number.	Remarks.
1. <i>H. leucopus</i>	Fort Simpson	B. R. Ross	4520	Skin.
1. <i>H. leucopus</i>	Middleboro', Mass	J. W. P. Jenks	1434	Skin. Nat. Mus. type.
1. <i>H. leucopus</i>	Fort Cobb	Dr. Palmer	9251	Skin.
1. <i>H. leucopus</i>	California	Dr. Cooper	7183	Skin.
1. <i>H. leucopus</i>	Pennsylvania	Dr. E. Michener	4856	Skull.
1. <i>H. leucopus</i>	Missouri	Dr. F. V. Hayden	2235	Skull.

Fortunately on the 30th of the next month, and in the same valley where I had taken my male and three young, another capture was made, this time a female of the little harvest mouse, *Ochetodon humilis*, with three young barely an hour old. These latter were placed in alcohol, while the mother was carefully measured, skinned, and skeletonized.† The measurements will be found in the comparative tables below.

Along with the specimens from the National Museum, Mr. True also sent me Cones's measurements and identifications of the same. These former are in inches and fractions, and as I employ in making such measurements the metric system only, I have carefully reduced Cones's measurements in the table to that scale, in order to conveniently compare them with my own, as taken from three of my Fort Wingate captures, referred to in the foregoing paragraphs.

Table of measurements of six skins of Hesperomys, including the type of H. Truei; and of one skin of Ochetodon humilis.

[Taken in centimeters and fractions.]

Specimens.	Nose to—				Tail to—		Soles.	Depth of cheek-pouch.	Height of ear.	Remarks.
	Eye.	Ear.	Oculpost.	Root of tail.	End of vertebrae.	End of hairs.				
4520. <i>Hesperomys leucopus</i> , ♀.*	1.5	2.6	3.8	7.7	7.3	7.6	1.9	1.7	1.3	.....
1434. <i>Hesperomys leucopus</i> .*	1.3	2.5	3.0	8.9	8.1	8.4	.....	.....	1.3	Nat. Mus. type.
9251. <i>H. l. sonoriensis</i> .*	1.4	2.4	3.2	8.7	.....	.....	.....	.....	1.6	Skin stretched.
7183. <i>H. leucopus</i> .*	1.3	2.3	3.0	7.6	.....	.....	.....	.....	1.3	.....
14904. <i>Hesperomys Truei</i> , ♂.	1.3	2.4	3.5	8.7	8.2	9.2	Manns.	Pes.	2.5	Collected at Fort Wingate, N. Mex., 16 March, 1885, by Dr. R. W. Shufeldt, U. S. A.
							1.0	2.0		

* I have taken the liberty to add a few measurements to those taken by Cones, and correct others.

† It may be of interest to remark here that of the many specimens of the southwestern types of *Neotoma floridana* that I have taken and measured, the females have always proved to be notably larger than the males.—R. W. S.

Table of measurements of six skins of *Hesperomys*, &c.—Continued.

Specimens.	Nose to—			Tail to—			Soles.		Depth of cheek-pouch.	Height of ear.	Remarks.
	Eye.	Ear.	Occiput.	Root of tail.	End of vertebrae.	End of hairs.					
							Manus.	Pes.			
Hesperomys leucopus, ♂.	1.4	2.4	3.1	7.8	7.2	7.5	1.1	2.0	.....	1.7	Collected at Fort Wingate, N. Mex., 16 May, 1885, by Dr. R. W. Shufeldt, U. S. A.
15130. Ochetodon humilis, ♀.	1.1	2.1	2.4	7.1	6.1	6.3	0.9	1.6	.....	1.3	Collected at Fort Wingate, N. Mex., 30 June, 1885, by Dr. R. W. Shufeldt, U. S. A. Nursing three young when captured.

Other interesting measurements are to be obtained from the two skulls of *Hesperomys leucopus* and that of *Ochetodon humilis* now before me, and for their convenient comparison these are also presented in a tabulated form.

Table of measurements of three skulls of *Hesperomys*, including the type of *H. Truei*, and of one skull of *Ochetodon humilis*.

[Given in centimeters and fractions.]

Catalogue number.	Species.	Sex.	Greatest length of skull.	Interzygomatic diameter (greatest width).	Depth of skull measured from vault of cranium to basio-sphenoid.	Remarks.
2235	<i>Hesperomys sonoriensis</i>	♂	2.55	1.45	0.8	2235 ♂ Nat. Mus. collection, Lower Missouri.
4856	<i>H. leucopus</i> . . . . .	.....	2.55	1.20	0.8	4856 Nat. Mus. collection, Pennsylvania.
14904	<i>H. Truei</i>	♂	2.90	1.50	0.9	Collected by Dr. Shufeldt. From specimen in preceding table.
15130	<i>Ochetodon humilis</i>	♀	2.10	1.05	0.7	From last specimen in preceding table. Fort Wingate, N. Mexico.

It is evident, aside from other characters given below, that the extraordinary size of the ears of the mouse captured by me on the 16th of March, as well as the superior dimensions and varying ratios of the diameters of its skull, entitle it at least to distinction as a new species. It gives me pleasure, therefore, to bestow upon it the name of my esteemed friend Mr. F. W. True, curator of mammals, in the United States National Museum.

All of the specimens of *Hesperomys* loaned me for comparison by the National Museum have the upper parts of a bright yellowish-brown, inclining to a tan color, while the parts beneath are of a pure white, the line of demarcation between the two being very distinct. Now, all the specimens of *Hesperomys* from this region are of a *very pale*, dull clay color above, and white beneath, but the line of demarcation not so evident at first sight, in consequence.

The dental formula in True's mouse agrees with the *Murina* generally, being, incisors $\frac{2}{2}$ and molars $\frac{3-3}{3-3}$; we notice, however, in the specimen that the cusps of both the mandibular and upper molars have been entirely worn off, leaving a shallow, longitudinal groove along their upper surfaces, connecting the three crowns. I am unable to say at the present writing what this is due to, or how constant it may be. To decide this we must have a better knowledge of the character of the food of this mouse, as well as the opportunity to examine specimens of different ages.

H. leucopus of this region, inhabiting as it does the valleys, no doubt subsists upon the softer vegetable substances which give rise to but little abrasion of the molar teeth, whereas *H. Truei*, a species which has chosen the rocky mountain sides for its home, now lives upon the flinty piñon nuts, and the spiny leaves of the trees upon which they grow, and these substances may have something to do with the wearing down of the molar teeth. The implantation of their roots agrees in general with that observed in other members of the genus, and these non-visible parts are equally well developed in them.

In the mandible of *Hesperomys*, we find the condyle and the small coronoid process separated by a long, shallow, longitudinal valley (Figs. 7 and 8, pl. XXI).

Again, in *Hesperomys* the nasal processes of the maxillaries do not project behind the nasals, as they invariably do in *Neotoma* (Figs. 4 and 5, pl. XXI, *N. Mx.*, *N. Mx'*). It is of interest to know also in regard to these two genera, that the ratios of the longitudinal and transverse diameters of the interparietal bones differ very markedly.

HESPEROMYS TRUEI, sp. nov.

True's Piñon Mouse.

DESCRIPTION.

(Adult male, in the flesh.)

A *Hesperomys* with a form more robust than in most others of the genus. Eyes large and capable of extraordinary protrusion when the animal is affrighted. Whiskers very long and many-haired. Ears presenting the normal generic characters, but remarkable for their unusual size. Upper halves are delicate, thin, and very sparsely covered with short, fine hairs. Fur rather longer than common, soft, loose, and flossy. Tail more thickly haired than in *H. leucopus*, and the hairs longer.

Color.—Upper parts of a yellowish brown with an admixture of black-

ish hairs, the latter best marked on the dorsum, becoming less so as we approach the sides. Sides bright fulvous. Entire under parts white, blending with the fulvous of the sides, the line of demarcation being by no means so evident as in *H. leucopus*. Upper sides of feet white. Tail bicolor; upper side blackish brown, white beneath. Manus and pes agree with *H. leucopus*.

Dental characters.—In the dental formula, as well as the method of implantation of the teeth, this animal agrees with *H. leucopus*, but in this, the type specimen, the crowns of the molars are peculiarly worn away, as described above. It will be interesting to examine other specimens with the view of looking into this subject, ascertaining, if possible, how far this condition is constant, and to what extent it may be due to age.

Cranial characters.—Although the skull presents in general the characters of the genus, it is considerably longer and larger in other ways than the skull of *H. leucopus*. (See table.) This increase in size has not been accompanied by an increase of strength or thickness of this structure; on the other hand, if anything, the skull of True's mouse is of a more attenuated and delicate composition than that of the common white-footed mouse. The basi-occipital is more emarginate also than in that species, and the petiotic is quite different in form.

In the mandible we find that the symphysial portion is not bent up so abruptly as it is in all forms of *H. leucopus*, and in consequence the lower incisors are directed about equally forwards and upwards, while in *H. leucopus* these teeth are, in most specimens, curved almost entirely upwards. (Figs. 7 and 8, pl. XXI.)

The skeleton of *H. Truei* presents many characters, apparently of specific value, by which it may be distinguished from that of *H. leucopus*. The manubrium of the sternum is shorter in the former species than in the latter; the anterior margin of the scapula is larger and more sharply angulated, and the posterior margin straighter; the posterior margin of the pelvis is much more rounded; the transverse processes of the lumbar vertebræ are more slender, and those of the sacrales wider.

True's piñon mouse differs then from the common white-footed mouse, *H. leucopus*, in the fact that it chooses a different character of the country where it is found, as its home; in its more robust form; in its extraordinarily large ears; in important cranial and skeletal characters; and in a very marked degree in general coloration, though less weight is to be attached to this last difference than to any of the others.

At present little or nothing is known of the habits of this mouse; in these, however, it probably largely agrees with other field mice. Living in the mountainous and piñon-covered belts of this region; building its nest in the hollow trunks of trees; subsisting upon such food as the country would afford a small rodent, and hibernating during the winter months.